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Method for evaluating a scattered light signal and a scattered light detector for realizing the method

Claims

1. Method for evaluating a scattered light signal generated by a scattered light receiver when detecting especially fine particles in a carrier medium,

   c h a r a c t e r i z e d i n t h a t

   the scattered light signal is run through a calibration step for calibration and adaptation to prevailing environmental conditions and/or a drift compensation step for calibration and adaptation to prevailing environmental conditions over a time period of at least 24 hours and/or a temperature compensation step for compensating the temperature dependency of the radiated light output of a light source and/or a sensitivity adjusting step for adaptation to a required sensitivity and/or a filter algorithm step for evaluating the scattered light signal subject to specific filter algorithms, and the scattered light signal is filtered differently depending on its slope prior to comparison with preset threshold values.

2. Method in accordance with claim 1 having an integration amplifier as a scattered light amplifier,

   c h a r a c t e r i z e d i n t h a t

   the integration time of said integration amplifier is set in the calibration step such that the scattered light signal corresponds to a reference signal of a reference indicator.

3. Method in accordance with claim 1 or 2,
characterized in that
the sensitivity of scattered light receiver (13) is changed in the sensitivity adjusting step by changing the pulse width of the drive current of a light source (9) associated with said scattered light receiver (13).

4. Method in accordance with claim 1 or 2,
characterized in that
the sensitivity of the scattered light receiver is changed in the sensitivity adjusting step by changing the integration time of an integration amplifier acting as a scattered light signal amplifier.

5. Method in accordance with claim 4,
characterized in that
changing the integration time ensues incrementally or continuously.

6. Method in accordance with claim 3,
characterized in that
changing the pulse width ensues incrementally or continuously.

7. Method in accordance with one of claims 1 to 6,
characterized in that
a temperature sensor (23) arranged in the flow path (7) of the carrier medium is used for the temperature compensation of the scattered light signal in the temperature compensation step.

8. Method in accordance with claim 7,
characterized in that
the temperature compensation ensues by changing the pulse width of the drive current of a light source (9) associated with said scattered light receiver (13).

9. Method in accordance with one of claims 1 to 8,
characterized in that
the scattered light signal is lowpass filtered when its slope exceeds a pre-defined threshold.

10. Method in accordance with one of claims 1 to 9,
characterized in that
a chamber value is averaged over a longer period of time in the drift compensation step to create a tracked chamber value.

11. Scattered light detector for carrying out the method in accordance with one of claims 1 to 9, having a housing (1), an inlet opening (3) and an outlet opening (5) in said housing (1), between which the carrier medium flows through said housing (1) on a flow path (7), having a light source (9) which directs light to a scattered light center (11) lying on the flow path (7), having a scattered light receiver (13) for a portion of the light scattered on particles in the scattered light center (11), and having a scattered light signal amplifier (17) for amplifying the scattered light signal, wherein scattered light signal amplifier (17) is configured as an integration amplifier,
characterized in that
a filter algorithm step is provided for filtering the scattered light signal based on its slope.

12. Scattered light detector in accordance with claim 11,
characterized in that
switching means (19,21) are provided for setting the sensitivity of scattered light receiver (13).

13. Scattered light detector in accordance with claim 11 or 12,
characterized in that
a communication interface, in particular to a PC or a network, is provided.

14. Scattered light detector in accordance with one of claims 11 to 13,
characterized in that
a switch input is provided for changing the sensitivity of scattered light receiver (13).

15. Scattered light detector in accordance with one of claims 11 to 14,
characterized in that
a temperature sensor (23) is provided in the flow path (7) of the carrier medium.

16. Scattered light detector in accordance with one of claims 11 to 15,
characterized in that
a flowmeter (25) is provided in the flow path (7) of the carrier medium.

17. Scattered light detector in accordance with claim 16,
characterized in that
flowmeter (25) consists of a thermoelectric air flow sensor and a thermoelectric temperature sensor.